JOHN BARTRAM HOUSE & GARDEN, GREENHOUSE
54th St. & LIndbergh Blvd.
Philadelphia
Philadelphia County
Pennsylvania

HALS No. PA-1-B

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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HISTORIC AMERICAN LANDSCAPES SURVEY

JOHN BARTRAM HOUSE AND GARDEN, GREENHOUSE (Seed House)

HALS No. PA–1–B

Location: 54th Street and Lindbergh Boulevard, Philadelphia, Independent City, Pennsylvania.

Present Owner: City of Philadelphia.

Occupant: Vacant.

Present Use: Unused.

Significance: The greenhouse at Bartram's Garden was constructed by John Bartram (1699–1777), the well-known early American botanist and explorer, in 1760–1761. Despite its later incorporation into a larger structure to the north, the greenhouse unit is essentially intact and remains among the earliest extant structures of this type in North America. Originally heated by an exterior-fed Pennsylvania Fireplace and interior flues, the greenhouse's thick rubble stone walls also aided in heat retention. Like the large house to its south, the greenhouse bears the individual stamp of John Bartram's hand, most clearly indicated by pieces of carved frieze imbedded in the south wall as well as decorative joint work known as galleting.

Historian: James A. Jacobs, Summer 2001.

PART I: HISTORICAL INFORMATION

A. Physical History:

1. Date of erection: 1760–1761.

2. Architect-builder: There was no architect for the greenhouse at Bartram's Garden in a modern sense of the term, however, like the large dwelling house to the south, John Bartram was surely responsible for the structure's stonework.[1] As early as 1737, Peter Collinson alluded to Bartram's stoneworking skills, he wrote: "I have heard of thy House & thy great art & Industry in building it…it makes me long to see it & the builder."[2] Furthermore, beyond Bartram's direct declaration that "I am A going to

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[1]In this report, use of "John Bartram" indicates John Bartram, Sr. (1699–1777). The name "John Bartram, Jr." refers to his son (1743–1812).

[2]Peter Collinson to John Bartram, 14 December 1737.

build A green-house" in a 1760 letter to Collinson, he already communicated his knowledge of stone quarrying and construction in a 1757 letter to another friend.[3] In addition to his process for working stone, the letter conveyed that he had already "built five houses of hewn stones split out of ye rock with my own hands."[4] John Bartram clearly had the knowledge and skill to construct a small, but well crafted, utilitarian structure.

3. Original and subsequent owners:

See "original and subsequent owners" section in the historical report for the John Bartram House and Garden, House, HALS No. PA–1–A.

4. Original plans and construction:

In June 1760, John Bartram wrote to his friend and English correspondent, Peter Collinson, that: "I am A going to build A green-house…stone is got & hope as soon as harvest is over to begin to build it."[5] Given the diminutive size of the structure, it was probably completed in 1761. It was assuredly completed and in use by December 1762 when Bartram wrote: "I have two flues in the back wall of my greenhouse."[6] These greenhouse references are believed to relate to the south end-unit of the present Seed House.[7] An early-1760s construction and/or modification date has been corroborated through archaeological investigation.

By the mid-eighteenth century no fewer than a half-dozen known greenhouses existed throughout the Philadelphia area both in the city proper

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[3]Bartram to Collinson, 24 June 1760, for quote; John Bartram's formal education did not extend beyond basic literacy and throughout his life Bartram's written correspondence was plagued with grammatical mistakes and misspellings. William J. Scheik, in "Telling A Wonder: Dialectic in the Writings of John Bartram," *Pennsylvania Magazine of History and Biography* 107:2 (1983): 235–248, notes that even Bartram's close friends—Peter Collinson and Peter Kalm, men who respected his breadth of understanding on an array of topics—offered commentary on his inability to write correctly. In a 3 November 1754 letter to Peter Collinson, Bartram both acknowledged as well as justified this deficiency: "good grammar & good spelling may please those that are more taken with A fine superficial flourish then real truth but my chief aim was to inform my readers of ye true real distinguishing characters of each genus." *In this report, direct quotations from Bartram correspondence will not include "[sic]" following mistakes, otherwise the passage would be riddled with them.* All direct quotes from letters to and from Bartram are drawn from *The Correspondence of John Bartram, 1734–1777*, eds. Edmund Berkeley and Dorothy Smith Berkeley (Gainesville, FL: University Press of Florida, 1992).

[4]Bartram to Jared Eliot, 24 January 1757.

[5]Bartram to Collinson, 24 June 1760.

[6]Bartram to Collinson, 3 December 1762.

[7]The Seed House is currently comprised—from south to north—of the greenhouse, a storage room, a classroom over an extant ice pit, and a kitchen over a cellar. The term "Seed House" was applied to the series of linked outbuildings early in the twentieth century. See Joel T. Fry, "The 'Seed House' at Bartram's Garden: An Archaeological Analysis, 1989–1990," Philadelphia, Pennsylvania, June 1991, 77, John Bowman Bartram Special Collections Library (hereafter JBBSCL), #2173.

and on surrounding country estates.[8] In addition to standing examples, Bartram had access to some of the most popular horticultural "help books," including Philip Miller's *Gardener's Dictionary* and John Evelyn's *Kalendarium Hortense*. Bartram was assuredly familiar with Miller's text. In a 1755 letter to Miller, he noted that "I have thy first & second book of ye Gardeners Dictionary, one sent me by Ld [Lord] Petre, ye other by Dr Dilenius [John Jacob Dillenius]"—these copies were in his possession by 1739.[9] Prior to

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[8]May Woods and Arete Swartz Warren, *Glass Houses: A History of Greenhouses, Orangeries and Conservatories* (New York: Rizzoli International Press, Inc., 1988), 86. In the eighteenth century, the terms *greenhouse*, *conservatory*, and *hothouse* were used interchangeably in popular discourse. Horticultural texts provided some distinction in terms. For example by definition, plants were kept in pots in a greenhouse while plants were bedded in conservatories. In either case, thermal heating might be augmented by artificial heating. Hothouse or *stove* was most often used in reference to a well-heated structure whose high temperatures were ideal for tropical and semi-tropical plants. *Hypocaust* and, later, steam heating systems were commonly employed in hothouses. The term *orangery* appeared most often in treatises and was not widely used by eighteenth-century Americans, perhaps on account of its aristocratic European associations. Nineteenth-century treatise writers commonly referred to eighteenth-century greenhouse structures—those of brick or stone, with large sash windows and unglazed roofs—as orangeries in contrast to later glasshouses distinguished by large expanses of glass, glazed roofs, and a degree of iron framing. See Therese O'Malley, "Conservatory," "Greenhouse," "Hothouse," and "Orangery," in "Keywords in American Landscape Design," National Gallery of Art in conjunction with Yale University Press, mss. Center for Advanced Study in the Visual Arts, Washington, D.C.

[9]Bartram to Philip Miller, 20 April 1755, for quote; Collinson to Bartram, 22 September 1739 and Bartram to Collinson ca. December 1739, for ownership date. In stating to Miller that "I have thy first & second book of ye Gardeners Dictionary," Bartram was referring to a complete, single-volume 1733 edition and a complementary 1739 volume—*The Second Volume of the Gardener's Dictionary: Which Completes the Work*—that included corrections, omissions, and new findings. Lord Petre gifted the 1739 supplement to Bartram in that year "in return for specimens sent him." (Collinson to Bartram, 22 September 1739) It is possible to deduce from other correspondence that John J. Dillenius sent him the first volume sometime prior. The books are now owned by the University of Pennsylvania. Penn obtained them early in the twentieth century after the foundation of a "John Bartram Memorial Library," co-supported by the University and the John Bartram Association. Between the 1890s and the 1920s, the interested parties gathered as many of John Bartram's books and other related volumes into a single library, which was housed at Penn. The John Bartram Memorial Library and other small libraries were collapsed into an overreaching university system in the 1960s. Book plates and handwritten passages in the volumes note that Bartram's copies of the *Gardener's Dictionary* were given to the John Bartram Association on 14 October 1914 in honor of Mr. and Mrs. Andrew M. Eastwick. Handwritten inscriptions also suggest that Andrew M. Eastwick purchased the volumes directly from Colonel Robert Carr—the husband of John Bartram's granddaughter Ann—on 14 June 1853; Eastwick had already purchased Bartram's botanical garden and the John Bartram House three years prior. Despite giving an exact date for the transaction, it appears that the books likely came into Eastwick's ownership through Edward Duncan Ingraham's estate auction. Notices pasted in the 1733 volume advertise the sale, which was set to begin on 20 March 1855, and include the auction entry describing a 1739 two-volume set of the *Gardener's Dictionary* owned by Bartram. Given their complementary nature and, perhaps, some sloppy catalogue research, it is possible to account for linking two books with obviously distinct publication dates into one set. Additionally, beyond practicing law in Philadelphia, Ingraham was a writer and *bibliophile* of note; it is not surprising that he possessed these volumes, especially given the Carrs' dire financial straits beginning late in the 1830s. In reference to the Eastwick purchase, it can be suggested that Andrew M. Eastwick purchased books at Colonel Carr's "public sale" on 14 June 1853, however, this purchase did not include Bartram's copies of the *Gardener's Dictionary*. Rather, Eastwick likely acquired them in 1855 at Ingraham's estate auction and at the time of the donation, with the passage of sixty years, Eastwick's son assumed they were part of the recorded 1853 Bartram book purchase. Information about the "John Bartram Memorial Library" obtained

constructing the greenhouse and beginning in 1755, Bartram and Miller corresponded regularly for some time. While surviving letters do not relate to the greenhouse, but rather to the seed and plant transactions initially made through Collinson, Miller sent Bartram portions of an edition "in progress"—possibly the seventh edition issued between 1756 and 1759. This new edition and the earlier versions included entries on and visuals of greenhouses, though on a much grander scale than the one Bartram constructed.

While there is no evidence that Bartram owned Evelyn's book, a 1729 fifth edition of the text was present in James Logan's library, to which Bartram had easy access. A greenhouse diagram and advocated dimensions (no more than 12'-0" to 13'-0" deep) included in this volume are similar to the modest structure that Bartram ultimately built—a simple one-room building with a gable roof, three solid walls, and an exterior stove and interior flues.[10] Like most North American design appropriations from European models and books, however, he likely used the descriptions and diagrams in Evelyn and Miller as a base, altering them to suit his needs, desires, and the demands of local materials and construction. Furthermore, by 1760, Bartram had been intimately involved in plant cultivation and botanical studies for many decades and surely held ideas about what environment was necessary for "winterizing" delicate plants and "forcing" others to bloom out of season.

Regardless of the design origin, the structure that Bartram planned in 1760 was relatively modest. Where they existed on rural estates and spacious urban plots, private greenhouses in eighteenth-century North America often ran towards the opulent—as evidenced by the greenhouse ruins at Mt. Airy on Virginia's Northern Neck. These hothouses generally provided wealthy families with a variety of exotic plants while at the same time providing a high-style backdrop to domestic landscapes. John Bartram did not envision such a structure. He commented that he wanted "to put in some pretty flowering winter shrubs & plants for winters diversion;" the greenhouse would "not be crowded with orange trees or those natural to the torrid zone but such as will do from being protected from the frost."[11] Bartram imagined a small space that kept a limited number of winter plants from freezing, not a sultry hothouse filled with tropical novelties.[12]

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through electronic correspondence from Joel T. Fry, Curator of Historic Collections, Historic Bartram's Garden to the author, 22 October 2001.

[10]John Evelyn, "Kalendarium Hortense: or, the Gardiner's Almanack," in *Silva: or, a Discourse of Forest-Trees, and the Propagation of Timber in His Majesty's Dominions*, 5th ed. (London, 1729), 228–230.

[11]Bartram to Collinson, 24 June 1760.

[12]Joel T. Fry, "Benjamin Franklin and the Pennsylvania Fireplace: A History and a New Example from Bartram's Garden," Philadelphia, Pennsylvania, November 1987, revised Apr. 1991, 64, JBBSCL, #2175.

Despite its modest nature, John Bartram was exacting in laying-up the walls. Narrow slabs of Wissahickon schist, likely quarried on his property, were interspersed with an occasional quartzite river cobble. The mortar work accentuated the care taken in constructing this building. Bartram imbedded small pieces of dark stone in the mortar of all three stone walls employing a process known as galleting. This decorative process appeared in various locales throughout the English colonies. Most notably, it was popular for the foundation walls of some of the finest eighteenth-century buildings in Annapolis, Maryland. The process apparently appealed to Kingsessing Township residents in the mid-eighteenth century. Three other surviving structures there from the 1760s—a house on Vodges Street, the Blue Ball Tavern, and the Church of St. James—all have similarly articulated joints.[13]

In addition to the mortar work, carved stone slabs present in the south wall underscore Bartram's interest in the greenhouse structure.[14] As noted previously, John Bartram was not a mason by trade, however at some point in his life he learned to quarry, cut, and lay-up stone. In addition to this, his declaration that he crafted "steps, dore-sills & large windo cases" indicates he was most likely knowledgeable in the more refined stone carving process as well.[15] A section of Doric frieze with triglyphs and metopes executed in naturalistic motifs is present under the window. This fragment is similar in dimension and artistic execution to an upside-down segment in the north shed of the John Bartram House and another in a garden retaining wall. These sections of frieze might have been part of a decorative scheme for the dwelling house later abandoned by Bartram and then reused by Bartram and his descendents.[16] The south window is topped by another carved stone fragment. This fragment appears to be part of a cornice with carved guttae "hanging" from a stone with two molded ridges. The greenhouse structure, though small, exhibits fine craftsmanship and decorative ornamentation.

A 1782 recount of a visit to the John Bartram House and Garden made by J. Hector St. John de Crévecoeur sometime between 1765 and 1770 mentions the greenhouse as well as a motto placed over the door.

> From his study we went into the garden, which contained a great variety of curious plants and shrubs; some grew in a greenhouse,

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[13]Ibid., 70.

[14]The greenhouse is not oriented true to the compass. In this report the following designations will be used: the board-and-batten wall faces southeast and will be referred to as "east;" the southwest wall with the gable and decorative stone will be "south;" the northwest wall with the door will be "west;" and the northeast wall, now integral with the appended shed, will be "north."

[15]Bartram to Eliot, 24 January 1757.

[16]Marsha Glenn for John M. Dickey, "Historic Structures Report, The John Bartram House," vol. 1, Philadelphia, Pennsylvania, 1 February 1978, 22.

> over the door of which were written these lines: '*Slave to no sect, who takes no private road, But looks through nature, up to nature's God!*'[17]

If it actually existed, the motto is consistent with Bartram's documented spiritual beliefs uniting a love of science and nature with the glorification of God.[18] No trace of the motto remains though it may have been crafted in lesser permanence than stone. Given other known inconsistencies in Crévecoeur's account of his visit with John Bartram—the travels and their publication were separated by more than a decade—it is entirely possible that motto and its association was the author's confusion or confection. Regardless, by noting the presence of a greenhouse, Crévecoeur both underscored the building as a notable feature of landscape as well as its rarity within the North American landscape.

While it is impossible to know exactly what sort of sash was located in the east wall of the structure, it is clear that the space was filled with number of windows each bearing numerous lights. An extant window in the John Bartram House study—most likely surviving from the 1760s construction—contains muntins extending 0'-7/8" from the glass that are 0'-1 3/8" wide; the dimensions of the lights are roughly 0'-7 1/2" x 0'-9 1/4". It is likely that these light and muntin dimensions are similar to what was present in the greenhouse's east wall—three or possibly four double-hung, multi-pane sash. A surviving timber extending north to south across the space's center may have been part of a support system for these windows. There are surviving sections of rough light-colored plaster on the north, south, and west walls. Philip Miller recommended an interior coating of "Stucco, or plastered with Morter [*sic*], and whitewashed…otherwise the Air in severe Frost will penetrate the Walls."[19] Importantly, a white plaster coating "reflects the Rays of Light in a much greater Quantity than any other Colour, and is of signal Service to Plants, especially in Winter."[20] The greenhouse windows were surely fitted with shutters to provide an added layer of protection during particularly cold weeks and advocated in both Evelyn and Miller's garden texts.

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[17]J. Hector St. John de Crévecoeur, "Letter: From Mr. Iw–n Al–z, a Russian Gentleman, Describing the Visit He Paid at My Request to Mr. John Bertram [*sic*], the Celebrated Pennsylvanian Botanist," in *Letters from an American Farmer and Sketches of Eighteenth-Century America*, London, 1782, reprint, Glouster, MA: Peter Smith, 1968), 191 (page citations are to the reprint edition). The motto noted in this account was drawn from Alexander Pope's *Essay on Man* (1732, 1733, 1744) and indicates either Crévecoeur's or Bartram's familiarity with humanist thought.

[18]Harold E. Taussig, "Deism in Philadelphia during the Age of Franklin," *Pennsylvania History* 37:3 (1970): 223.

[19]Philip Miller, *The Gardener's Dictionary: Containing the Methods of Cultivating and Improving all Sorts of Trees, Plants, and Flowers, for the Kitchen, Fruit, and Pleasure Gardens; as Also Those Which Are Used in Medicine*, 4th ed., corrected and enlarged, 3 vols., (London, 1754; reprint, *The Gardener's Dictionary*, abridged ed., New York: Stechert-Hafner, 1969), 581 (page citations are to the reprint edition).

[20]Ibid.

While multi-paned window sash was common by this time as roofing in European greenhouses and, without conclusive evidence, it is impossible to eliminate Bartram's experimentation this roof type, it is unlikely that his had any roof glass. Until after the Revolution, glass was an expensive material in the English colonies, even small greenhouses declared a degree of status on account of this expense.[21] Few greenhouses in North America included glazed roofs until after the mass production of glass and iron late in the eighteenth and early in the nineteenth centuries.[22] Additionally, physical evidence suggests that the heavy east-west beams extending across the greenhouse interior were present from the beginning. Given the structure's modest size, without a loft the beams serve no function; the presence of a storage loft negates the possibility of a glazed or partially glazed roof. Furthermore, a roof with glassed sections would not have been as thermally efficient as a "solid roof."[23]

While the sun provided a degree of solar heat through the large window openings, the warmth necessary for keeping out seasonal chills required a stove. Bartram apparently heeded Peter Collinson's advice to "contrive and Make a Stove in it [the greenhouse] to give heat in Severe Weather."[24] Given the small space and Bartram's functional needs, he did not employ a more sophisticated hypocaust heating system common in ornamental hothouses; rather, Bartram located an iron Pennsylvania Fireplace and related flues (2) in the new structure's south wall. This heating arrangement will be more fully discussed in the "historical context" section of this report. The stove and flue openings in the south wall are positioned below the floor of the first story. In the *Gardener's Dictionary*, Philip Miller promoted a floor located 2'-0" to 3'-0" above the ground to reduce the ill effects of the winter "damps" on the plants.[25] Locating the floor this high above the ground would have provided plenty of space for constructing the necessary flues and allow for thorough radiation of air under the entire floor.[26]

In summary, in the later part of 1760 and early in 1761, John Bartram crafted a fine stone, roughly square, one-and-one-half story greenhouse fitted with large east-facing window sash and an exterior-fed Pennsylvania Fireplace with two flues.

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[21]O'Malley, "Greenhouse," 4.

[22]O'Malley, "Orangery," 2.

[23]Georg Kohlmaier and Barna von Sartory, *Houses of Glass: A Nineteenth-Century Building Type*, 1981, trans. John C. Harvey (Cambridge, MA: The MIT Press, 1986), 52.

[24]Collinson to Bartram, 15 September 1760.

[25]Miller (1754), 580.

[26]O'Malley, "Greenhouse," 2.

5. Alterations and additions:

Sometime between 1760 and 1830, an older, free-standing stone shed structure to the greenhouse's north was enlarged and made integral with the greenhouse.[27] With the exception of the greenhouse's north wall, which was extended eastward 3'-0" to meet the shed's new east wall, no other significant changes were exacted on the greenhouse.

During the same period, an ice pit was sunk north of the enlarged shed. This feature was fully enclosed after 1830 with a room constructed over it at ground level and another cellar and ground-level room abutting these space's to the north. Sometime in the nineteenth century, probably after 1850 with Andrew Eastwick's repairs and additions to the outbuildings, these four units were contained under a single new roof. To complete this regularization, the gable of the greenhouse's south wall had to be raised upwards and eastwards. This addition was not done haphazardly as the mason closely matched the stones and laid them up using galleted mortar; only the mortar color conspicuously differentiates the eighteenth-century section from the nineteenth-century section.

No other consequential changes have occurred to the structure, which has been left unused and, though currently stabilized, deteriorating on the interior. As indicated in a notebook of early-twentieth century measured sketches of the outbuildings, by that time the loft window sash had disappeared and a site plan shows a small shed built up against the east (board-and-batten-wall), accessed from the exterior.[28] The shed has disappeared and a window is now present in the loft-level opening. Early in the 1990s, the west door and the Seed House roof were replaced as part of a rehabilitation of the farmyard court.

B. Historical context

See the "historical context" section in the report for the John Bartram House and Garden, House, HALS No. PA–1–A, for additional information related to the Bartrams and other site history.

<u>The First Greenhouse Constructed at Bartram's Garden</u>
What first appeared in sixteenth century Europe as seasonal shelter erected around plants in the ground, had by the first decades of the eighteenth century become the "permanent orangery"—a long heated building with south-facing windows and thick walls into which plants were moved cyclically.[29] Not surprisingly, the appearance of

[27]Unless otherwise noted, all of the information related to the alterations and additions to the greenhouse is drawn from Fry, "Seed House," 73–77.
[28]"Hand drawn notebook of architectural drawings," mss., JBBSCL.
[29]Kohlmaier, 43.

what essentially constituted a structure for pleasurable and largely non-subsistence horticulture did not occur in English North America until the eighteenth century, long after greenhouses were common features in many European garden landscapes. By late in the 1730s, the historical record notes the presence of greenhouses along the Atlantic seaboard from Virginia to Boston and by mid-century a number of them existed in the city of Philadelphia and the surrounding countryside.[30] It is not surprising, then, that a man intensely interested in and deriving a living from plants and botanical study would construct a greenhouse of his own.

John Bartram's primary source of subsistence was the cultivation of his farmland, however he was also creating a base of knowledge regarding North American plant species and botanical sciences that would both augment his earnings as well as bring him world renown. In 1733, Bartram and Peter Collinson were introduced through transatlantic business contacts. While never meeting in person, they ultimately became lifelong friends and business partners and exchanged letters frequently. Collinson busied himself with colonial trade and held an immense interest in gardening and exotic plants.[31] Through Bartram, Collinson gained direct access to the North American plants and seeds and ultimately became his European connection to other plant fanatics. Included in the Bartram-Collinson circle of clients was Philip Miller, the noted author of the *Gardener's Dictionary* and curator of the Physic Garden of the London Apothecaries at Chelsea from 1722–1770.[32] Miller and Bartram later wrote to each other directly and worked out exchanges of seeds, plants, and horticultural information.[33] At first, compensation for Bartram's work was informal. Collinson wrote in 1734/35:

> I am very sensible of the great pains & many Tiresome Trips to Collect so many Rare plants scattered att a distance. I shall not forget It: but in some measure to show my Gratitude, tho' not In proportion to thy Trouble I have sent thee a small token a Callico gown for thy wife & some odd Little things that may be of use amongst the Children.[34]

Ultimately, more regular payment schedules were worked out based on the number of boxes shipped.[35] Under Collinson and other clients' encouragement and his own *wanderlust*, Bartram made trips throughout the North American colonies that greatly expanded his geographical and botanical knowledge of the continent. In addition to

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[30]Woods, 68, for Virginia, 84, for Boston, 86, for Philadelphia.

[31]Edmund Berkeley and Dorothy Smith Berkeley, *The Life and Travels of John Bartram: From Lake Ontario to the River St. John* (Tallahassee: University Presses of Florida, 1982), 18–19.

[32]Barbara Wells Sarudy, *Gardens and Gardening in the Chesapeake, 1700–1805* (Baltimore: The Johns Hopkins University Press, 1998), 94.

[33]See Bartram–Miller correspondence, 1755 to 1759.

[34]Bartram to Collinson, 24 January 1734/35.

[35]Martha Crary Halpern, "Man's Use and Love of Nature," vol. III, Philadelphia, Pennsylvania, 1990, 42–43, JBBSCL, #2186.3. Given the problems with transferring specie in the eighteenth-century transatlantic world, Bartram's payment often continued to be in goods, but "bills of exchange" were also negotiated between Philadelphia and London commercial establishments. Joel T. Fry to author, electronic correspondence, 23 October 2001.

collecting and sales, Bartram furthered his knowledge of botany through his associations with men like James Logan and Benjamin Franklin—and, importantly, their libraries. Additionally, payment for his services rendered to English plant enthusiasts occasionally came in the form of books and treatises.[36] Late in the 1730s Bartram began to personally and directly delve into the science of plants; by 1737, he was corresponding with Oxford botanist John Jacob Dillenius and in 1740 was conducting his own observations and experiments about plant reproduction.[37] Over time, Bartram became a respected member of the international scientific and intellectual community, ultimately co-founding the American Philosophical Society with Benjamin Franklin in 1743 and being named the "King's Botanist" in 1765.

> I have the pleasure to Inform my Good Friend that my Repeated Solicitations have not been in Vain for this Day I received certain Intelligence from our Gracious King that He had appointed thee His Botanist with a salary of Fifty pounds a Year & in pursuance thereof I received they first half years payment of thy Salary, Being Twenty five pounds to Lady Day last—which I have carried to thy Account.[38]

While Bartram's knowledge of and contributions to botany were acknowledged and respected throughout the western world, the impetus for constructing what was likely the first greenhouse at Bartram's Garden appears to be more related to the family plant business and his own personal pleasure taken in cultivation. In 1760, he wrote that he planned on filling the small greenhouse with "some pretty flowering winter shrubs & plants for winters diversion not to be crowded with orange trees or those natural to the torrid zone."[39] While Bartram may very well have been creating the greenhouse for his own "winters diversion" in horticulture, the family plant business had grown so large by 1760 that it is likely at least some of the plants grown there were meant for a paying customer's "diversion" as well.

What began as a fairly modest business enterprise with Collinson in the 1730s had, by early in the 1760s, turned into a major commercial nursery business concentrated in native species and servicing both English and American clients.[40] The disruption of the Revolution eliminated English trade for a period and while they continued to conduct business with European clients until the 1840s, interest in the domestic markets increased during the war. By 1812, two greenhouses—one from 1760–1761 and a larger one from ca. 1800—were present on the site and likely associated with the business.[41] Twenty-five years later, the enterprise included ten exotic "houses," a number of them were hothouses; the small greenhouse constructed by Bartram was not included in this inventory.[42] The original greenhouse probably passed out of use

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[36]Bartram to Miller, 20 April 1755.
[37]Berkeley, 63–65.
[38]Collinson to Bartram, 9 April 1765.
[39]Bartram to Collinson, 24 June 1760.
[40]Halpern, 55.
[41]Fry, "Pennsylvania Fireplace," 61.
[42]Alexander Gordon, "Communication: Bartram Botanic Garden," *The Genesee Farmer* 7:28 (15 Jul. 1837): 220, JBBSCL, newspaper and periodical archive.

for plant growing around 1817 as the front plate from the Pennsylvania Fireplace likely used to heat the space was found in the floor of a large new glasshouse constructed at that time.[43]

The Greenhouse Heating System

In 1988, archaeological exploration south of the Seed House uncovered most of the front plate of a Pennsylvania Fireplace.[44] It was not believed to have been part of the heating system for the ca. 1817 greenhouse under excavation, rather, it was set into the floor and laid flat among the stone slabs. Given the particular form of plate—from a stove combining new technologies with German artistic motifs—it most likely dates from the final phase of Pennsylvania Fireplace manufacture between 1760 and 1766. The found plate is decorated with an anthropomorphic sun motif surrounded by tulips and foliage. It is believed that the stove originally containing the plate was fitted in the west opening of the 1760–1761 greenhouse's south wall with the flue structure utilizing two smaller openings to the east.

One historian has commented in regard to early greenhouse heating, "as long as greenhouses had small dimensions and were…provided with a massive, heat retaining north wall and a solid roof, primitive stoves or smoke flues sufficed to warm their interiors."[45] John Bartram's greenhouse snugly fits this criteria and further supports the belief that the stoveplate was part of the original greenhouse heating system with an exterior-fed stove and interior flues. His decision regarding this type of heating system probably had more to do with volumes read than with Bartram's friendship with Benjamin Franklin, the progenitor of the Pennsylvania Fireplace. As already noted, Bartram was quite familiar with Philip Miller's *Gardener's Dictionary* and was likely familiar with Evelyn's diagram of a small greenhouse with a flue heating system. Both volumes encouraged the construction of a stove and flues outside of the greenhouse proper as the resulting environment in those with interior fires was—as noted in Miller—"very injurious to the Plants."[46] The use of a wooden floor raised up from the ground represented an "improved design" with heat radiating outward under the floor for more even heating.[47] Bartram's care in both building and heating the structure surely resulted in a functional greenhouse that augmented both commercial profits and personal pleasure.

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[43]Fry, "Pennsylvania Fireplace," 75.

[44]Unless otherwise noted, all of the information in this section is drawn from Fry, "Pennsylvania Fireplace," largely from pages 50 to 69.

[45]Kohlmaier, 52.

[46]Miller (1754), 581.

[47]O'Malley, "Greenhouse," 2.

PART II: ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural character: The greenhouse at Bartram's Garden stands as a modest, though early, example of an eighteenth-century greenhouse in North America. Despite its diminutive presence, the structure was built with care as evidenced by the galleting employed in laying-up the stone walls and the pieces of carved frieze imbedded in the south wall. Once freestanding, the structure now exists at the south end of a series of attached units with varying construction dates, collectively referred to as the "Seed House."

2. Condition of fabric: exterior—very good; interior—poor, debris filled, though currently stable.

B. Description of Exterior:

1. Overall dimensions: The structure bears an essentially square plan at approximately 13'-5" x 14'-0"; the ridgeline of the roof rises to roughly 16'-3" on the south side.

Foundations: Random-coursed rubble-stone approximately 1'-0" thick on the north, south, and west sides. A low stone wall approximately 1'-0" high and topped by four courses of standard brick extends 3'-8" southward from the north wall; the east joist sits on top of this construct.[48]

3. Walls: The north, south, and west walls are laid-up with narrow slabs of Wissahickon schist interspersed occasionally with quartzite river cobbles. Small pieces of dark stone are imbedded in the mortar in a decorative process called galleting.

West Elevation: With the exception of a centrally-placed door, this face is unarticulated beyond the aforementioned stonework.

East Elevation: Originally the "glass wall" of the greenhouse, the space once occupied by sash is now filled with vertical boards and battens. A timber girt runs above this infill and the ends of the four loft joists—notched over the timber—are clearly visible. Wide planks bearing residual green paint fill the space above this timber under the expanded roof. The south wall extends 1'-0" beyond the boarding. As indicated by a vertical seam, the north wall originally terminated about 1'-0" beyond the wall as well, however, it was extended 3'-0" further when the adjacent shed unit was enlarged. A built-in bench is present in front of the board partition at ground level.

[48]Fry, "Seed House," 69.

North Elevation: Originally an exterior wall, it is now the south interior wall of the second unit of the Seed House. There are no openings and no evidence indicating that there ever were windows or doors in this face. The "exterior" surface is presently covered in roughcast.

South Elevation: This wall is the most articulated of the four. While the seam where the roof was later raised is easily discerned, unlike the north wall, the south wall was not extended eastward to accommodate the new roof. A wood brace extends back from the roof's end to the wall. A vertically-oriented, fixed six-light window opening onto the loft is centered on the roof's original ridgeline. A slab of Doric frieze with triglyphs and metopes bearing naturalistic motifs is present under the window. The window is topped by another carved stone fragment. This fragment appears to be a cornice with guttae "hanging" from the molded stone. Three rectilinear openings are at or near ground level on the bottom of this wall.

4. Structural systems, framing: Load-bearing stone walls. On the lower story, hewn floor joists approximately 0'-5 1/2"square run north to south and are let into pockets in the foundation walls; three of five survive. On the loft story, four extant hewn joists running east to west are carried on top of the stone west wall and notched over a timber girt in the east wall. A timber extends north to south in the middle of the east wall in the same plain as the floor joist and girt. The present roof structure extends over the entire Seed House and is composed of common rafters with narrow collar "beams." In the greenhouse, most of the rafter pairs butt against each other at the apex and are nailed together, rather than employing any sort of complex joinery. On the west, the rafters sit on a wood plate resting on the stone wall, on the east they extend past the wall and terminate outside as part of an overhang.

5. Openings:

   a. Doors and doorways: The west door is positioned about 1'-0" above ground level and contained in a simple frame with plain molding; a massive stone threshold is present. The door, hung with strap hinges, is composed of plain vertical beaded boards backed by "Z" bracing.

   b. Windows, window frames: One fixed six-pane window lights the loft story on the south wall. It is contained in a simple frame.

6. Roof: A single wood shingle roof covers the entire Seed House. There is a significant overhang on the east side of the greenhouse unit.

C. Description of Interior:

1. The structure is a single cell with a loft above. The space between the top of the lower joists and the underside of the upper joists is approximately 5'-6". There are no floor boards on the west side and the door is located about three feet above the dirt below the floor joists.

2. Flooring: Dirt below the lower joists. Loose boards are laid across half of the lower story. The loft contains some fixed tongue-and-groove planks on the east side.

3. Wall and ceiling finish: Sections of rough plaster survive on the north, south, and east walls.

4. Mechanical: The unit contains no wiring, plumbing, or heating. The electrical box connecting the power grid and the John Bartram House is located on the south wall.

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Visuals

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Photographic Files. John Bowman Bartram Special Collections Library.

Original copy of the 1758 draught of the house and garden is located in the Early of Darby Collection, Knowsley Hall, near Liverpool, England. Copies are located in the John Bowman Bartram Special Collections Library.

PART IV: PROJECT INFORMATION

The project was co-sponsored by the Historic American Buildings Survey (HABS) of the National Park Service, U.S. Department of the Interior, as a pilot project for a new program, the Historic American Landscapes Survey (HALS); the John Bartram Association, Sidney Spahr, President; Historic Bartram's Garden, Timothy A. Storbeck, Acting Director; and the Getty Grant Program, part of the J. Paul Getty Trust. Research assistance and other support provided by Joel T. Fry, Curator of Historic Collections, and the resident staff of Historic Bartram's Garden. The documentation of the John Bartram House was undertaken by the Historic American Buildings Survey, E. Blaine Cliver, Chief of HABS/HAER/HALS; under the direction of Paul D. Dolinsky, Chief of HABS, Acting Chief of HALS. The project leaders were HABS architect Robert R. Arzola and HABS historian Catherine C. Lavoie. The project was completed during the Summer of 2001 at Historic Bartram's Garden, Philadelphia, by project supervisor Mary Ellen Strain, architect, Philadelphia; architecture technicians Kathryn A. Falwell (Tulane University) and Kelton H. Villavicencio (ICOMOS international intern—Nicaragua). The project historian was James A. Jacobs (HABS/The George Washington University). The large-format photography was produced by Joseph Elliott.